

REMARKS**Status of the Claims**

Claims 1-12 were previously pending. Claim 8 has been canceled. Accordingly claims 1-7, and 9-12 are pending and at issue.

Applicants note that the preliminary amendment filed March 19, 2004 inadvertently introduced extra words into claim 1. Claim 1 was listed therein as "original." No amendment to claim 1 was intended, and the introduction of the extra words was a clerical mistake. Claim 1 is set forth herein without the extra words, and is still listed as original.

Rejections Under 35 U.S.C. § 112

Claim 2 has been rejected because it recites a narrow limitation that falls within a broad limitation that is also recited in the claim. Claim 2 has been amended to remove the broader range. Applicants request that this rejection be withdrawn.

Rejections Under 35 U.S.C. § 103(a)

Claims 1-7 and 9-12 stand rejected as obvious over Harada (U.S. Published Application No. 2002/0090335) in view of Guo (U.S. Patent No. 6,827,916) and Vita (U.S. Patent No. 2,985,506). The Examiner states that Harada teaches a process for producing a dielectric material comprising homogenous spherical barium titanate particles having a Ba/Ti ratio of greater than one in which the particles are sintered into a ceramic body. The Examiner also states that the barium titanate of Harada is produced by mixing titanium tetrachloride with barium chloride or barium nitrate introduced with an aqueous alkali solution, and that the reaction solution is aged at a temperature of 40 to 100°C and then subjected to a hydrothermal treatment at 100 to 350°C, filtered, washed with water and dried.

The Examiner infers that Harada does not teach (a) a concentration of metal ions ranging from 0.1 to 2.0 mol/L; (b) the base concentration in the solution II ranging from 3 to 15 mol/L; (c)

flow rates of the solutions range from 5 to 300 L/h with flow rate ratios of the solutions I and II ranging from 0.5 to 10, and (d) a reaction mixture maintained at a constant OH⁻ concentration at a pH of about 14, and (e) conducting the reaction in a high gravity reactor. Instead the Examiner relies on Vita, which purportedly discloses a process for producing barium titanate particles in which the flow rates and concentrations are varied for the purpose of controlling the crystal form and particle size of the barium titanate particles; and Guo, which purportedly discloses conducting reactions in a high-gravity reactor.

Applicants respectfully disagree with the rejection and request reconsideration in view of the below remarks.

Claim 1 recites, *inter alia*, "maintaining the reaction mixture at a constant OH⁻ concentration". As noted above, the Examiner infers that this limitation is not taught by Harada. The Examiner relies on Vita to teach this claim limitation, in particular, the passage in Vita that states:

By regulating the rate of flow and the concentration of *the solution fed thru tube 3* and by regulating the rate of flow of the combustion gas thru tube 4 it becomes possible to control the temperature of the reaction in the combustion tube 6, the crystal form and the particle size of the formed barium titanate crystals.

(Vita, column 2, lines 55-60, emphasis added). Vita, however, does not teach a feed solution that would contain, for example, OH⁻ ions. Accordingly, Vita cannot be relied upon to teach or suggest "maintaining the reaction mixture at a constant OH⁻ concentration".

More particularly, Vita teaches introducing:

[a] mixture of barium alcoholate and titanium alcoholate in an organic solvent and passing this mixture thru an atomizer together with a gas which will support combustion

(Vita, column 1, lines 66-73). The organic solvents specifically illustrated in Vita -- isopropyl alcohol, butyl alcohol, benzene, toluene and zylene -- would not disassociate to form hydroxy ions.

There would no motivation to maintain a constant OH⁻ concentration based on Vita given that such ions are altogether absent in the reaction scheme. As the references, as combined, do not teach or suggest "maintaining the reaction mixture at a constant OH⁻ concentration" a *prima facie* case of obviousness has not been made. Applicants request that this rejection be withdrawn.

Furthermore, Applicants note that no cited reference teaches using a high gravity reactor to produce barium titanate powders. Guo is directed to a method of preparing silica. Only upon the impermissible use of hindsight would a person of ordinary skill be motivated to combine Guo with references directed to preparing barium titanate. Furthermore, the reaction disclosed in Guo is a gas/liquid reaction, wherein a Higee reactor is used to improve the mass transfer velocity of the reactants (water glass and carbon dioxide) in order to increase reaction efficiency. It is well known that carbon dioxide is only slightly soluble in water at standard conditions and its solubility in water decreases as temperature increases. Accordingly, the liquid reactant is recycled and continuously reacted in the Higee reactor set forth in Guo so as to increase reaction efficiency (see claim 4 of Guo). In contrast the present application teaches a liquid/liquid reaction, as opposed to a liquid/gas reaction. It would not have been obvious to employ a liquid/liquid reaction based on the Guo disclosure.

Lastly, a person of ordinary skill in the art would not be motivated to combine Guo with Harada. In Guo carbon dioxide and water glass are carbonized using air at high pressure. In contrast, Harada teaches:

In the process of the present invention, it is **required** that nitrogen is flowed through the reaction system **so as to prevent the barium compound from being reacted with carbon dioxide gas in air or the like.**

(Harada, page 5, paragraph 77, emphasis added). Accordingly, Harada teaches away from Guo, and a person of ordinary skill in the art would not be motivated to combine the two references.

Claim 2 stands rejected as obvious over Harada in view of Guo, Vita and Kawamoto (U.S. Published Application No. 2003/0022784). Claim 5 stands rejected as obvious over Harada in view of Guo, Vita and Kerchner (U.S. Patent No. 6,129,903).

Applicants submit that a *prima facie* case of obviousness has not been established due at least to the reasons set forth above. Kawamoto states that "no particular limitation is imposed on the methods for manufacturing the barium titanate powder" and does not teach or suggest "maintaining the reaction mixture at a constant OH⁻ concentration". Kerchner also does not teach or suggest "maintaining the reaction mixture at a constant OH⁻ concentration". Applicants request that the obviousness rejection be withdrawn.

Claim 8 stands rejected as obvious over Harada in view of Guo and Vita and Shirakawa (U.S. Published Patent Application No. 2003/0044347). Claim 8 has been canceled. Accordingly this rejection is moot.

In view of the above amendments and remarks, it is respectfully requested that the application be reconsidered and that all pending claims be allowed and the case passed to issue.

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Respectfully/submitted,

By 10/10/11

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